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The CHEMIST

OCTOBER, 1936 VOLUME XIII, NO. 7

AMERICAN INSTITUTE OF CHEMISTS

CHEMISTS IN PHILATELY

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THE WIZARD OF TUSKEGEE

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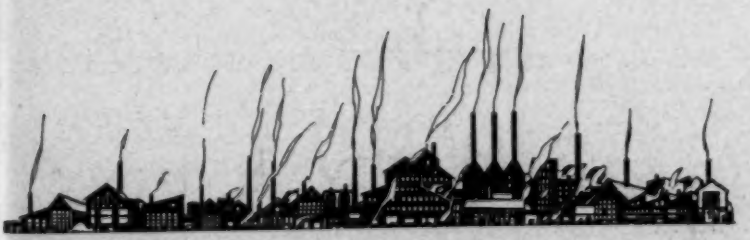
SIMULTANEOUS REACTIONS



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The CHEMIST

Publication of

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THE AMERICAN INSTITUTE OF CHEMISTS
HOWARD S. NEIMAN, *Secretary*
233 Broadway
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EDITORIAL

Co-operative Need of Chemists

by **Howard S. Neiman, Secretary, A.I.C.**

Out of the smoke and devastation of the war, there has arisen an appreciation of the necessity of co-operation between individuals as well as between nations. It was only by the cementing together of many different ideas and by the marching together, shoulder to shoulder, of many men that the war was won.

The lesson thus taught by conflict has made a great impression upon men in time of peace, and this is especially true with regard to those interested in chemistry.

The duties of many chemists isolate them largely from their fellow scientists. Their investigations are to a great extent of a secret nature. Their work is along lines which cannot, in justice to their employers, be divulged to others. They have become hermits, living alone in their scientific caves.

It is interesting and encouraging to note that this idea of co-operation has made its greatest impression upon those chemists who have been active in the science for a long period of time, and hence have noted the failures due to isolation; as is evidenced by the fact that by far the greater proportion of the seventy per cent increase in membership which THE AMERICAN INSTITUTE OF CHEMISTS has enjoyed in the last year and a half is composed of chemists of many years' experience.

Great organizations are founded upon the co-operation of many minds toward a desired end, and if the science of chemistry is to reach the greatness which it deserves, it must be through the universal co-operation of the chemists themselves.

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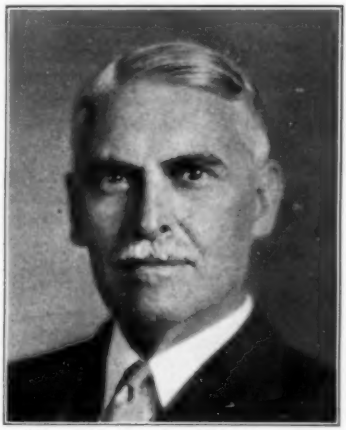
New Honorary Members

MOSES GOMBERG



WILLIAM FOSTER

Moses Gomberg was elected to Honorary membership in THE AMERICAN INSTITUTE OF CHEMISTS in recognition of his outstanding contributions as educator to the profession of chemistry.

Dr. Gomberg was born at Elizabetgrad, Russia. He obtained three degrees from the University of Michigan, studied at Munich and Heidelberg, and received an honorary Sc.D. degree from the University of Chicago. He has been awarded the Nichols medal (1914), the Willard Gibbs medal (1925), and the Chandler medal (1927). He was chairman of the department of chemistry at the University of Michigan until his recent retirement.

William Foster, a Fellow of THE AMERICAN INSTITUTE OF CHEMISTS since 1929, was elected to Honorary membership in recognition of his outstanding contributions as educator to the profession of chemistry.

Born at Hartford, Kentucky, Dr. Foster was educated at Hartford, Vanderbilt, and Princeton. He has been a member of the faculty of Princeton University since 1900, attaining full professorship in 1910. He is the author of several text-books on chemistry and of various papers in American, English, and German periodicals. He plans to retire from teaching next year.

Chemists in Philately

By J. N. Taylor, F.A.I.C.

CHEMISTS have been honored throughout the world in many ways and their achievements have been variously recognized by the public, by professional and scientific organizations, by institutions of learning, and by governments. Only a few chemists, however, have received philatelic honors. France, Russia, Turkey, and The Netherlands have issued special postage stamps portraying eminent chemists while Germany and Luxemburg have issued postal paper representing the chemist impersonally.

Germany

Luxemburg

While philately has not been over-generous in the number of stamps devoted to the chemist, it has not overlooked, however, any major period in chemical history. It has covered the mythological aspect, the period of incubation, and the modern era.

Mythology

The mythological forerunner of the chemist was brought into the philatelic picture when Egypt in 1925 issued three stamps (Scott No. 105-107) depicting the ancient god Thoth. Tradition indicates that Thoth and Hermes Trismegistus were one and the same, and according to the Byzantine ecclesiastics, the sacred art of alchemy had its origin with the "thrice greatest Hermes." Thoth is represented in type A38 as a human figure with the head of an ibis and writing on a cartouche. Greece has issued several stamps portraying Hermes (Mercury), a divinity assimilated by the Greeks from the Egyptian Thoth.

Hermes

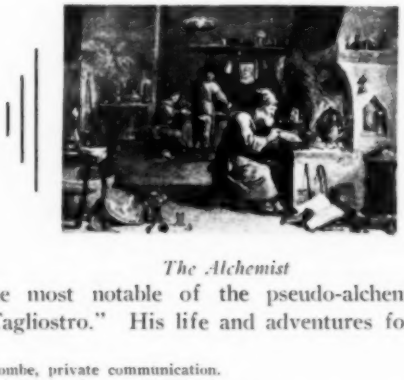
Thoth

The Alchemist

Legendary records claim that Hermes Trismegistus "inscribed upon an emerald the most essential secrets of alchemy and presented this jewel to Sarah, the wife of Abraham." The Emerald Tablet was lost but the inscription on it was handed down and for centuries the adepts continued their quest for the *One Thing*. During the Middle Ages the alchemists flourished. Albertus Magnus, Raymond Lully, Roger Bacon, Basil Valentine, Paracelsus—these are familiar names connoting much of romance as well as much of tragedy. The alchemists have been criticized for their vagueness and obscurity and for their use of cabalistic symbols, but,

> "Was not all knowledge
> Of the Egyptians writ in mystic symbols?
> Speak not the Scriptures oft in parables?
> Are not the choicest fables of the poets
> That were the fountains and first springs of wisdom
> Wrapped in perplexed allegories?"

An alchemist is shown on a United States private proprietary medicine stamp[1] (Barry's Tricopherous No. 5306—1865-74 and Barry's Proprietary No. 5307—1874-82). The central part of the stamp[2] is an adaptation of Teniers' painting *Le Chemiste* shown in the accompanying illustration[3].



The Alchemist

Among the most notable of the pseudo-alchemists was "Count Alessandro Cagliostro." His life and adventures form the subject of

[1]H. W. Holcombe, private communication.

[2]D. D. Berolzheimer, private communication.

[3]My thanks are due to Mr. Berolzheimer for his courtesy in allowing the use of this illustration. The print is No. 2 in the "Berolzheimer Series of Alchemical and Historical Reproductions," and was taken from an etching by Jac Phillipe Le Bas (1708-82), a celebrated Parisian artist and etcher. The original painting from which the etching was made is by David Teniers, the Younger (1610-90), and is in the Earl of Ellsmere Collection, Bridgewater House, London.

works by Schiller, Goethe and Dumas — the latter in his romances "Memoirs of a Physician" and "The Queen's Necklace." That Cagliostro "is rightfully placed in the category of pseudo-alchemists is certain, but it also appears equally certain that, charlatan though he was, posterity has not always done him that justice which is due to all men, however bad they may be."

The advent of chemistry as a science saw the decline of alchemy and the passing of the exponents of the hermetic art. Boerhaave was perhaps the last distinguished chemist who leaned toward the doctrines and practices of the alchemists, for after him no notable scientist supported these tenets.

Boerhaave

(1668-1738)

Boerhaave's likeness entered philately's gallery in 1928 when the Netherlands issued a postage stamp bearing his portrait. This stamp, (Scott No. 486), type SP 32, is a five cent (plus three) green. The surtax on the stamp was for the benefit of Child Welfare Societies.

Boerhaave

Hermann Boerhaave was born on December 31, 1668, in Voorhout near Leyden. Although originally destined for the service of the Church, he devoted himself to the study of medicine and at the same time became versed in the natural sciences, especially chemistry. In 1709, he was appointed professor of medicine, botany, and chemistry at the University of Leyden, where he attained the highest distinction.

Boerhaave's studies and experimental work in connection with calcination were noteworthy, but his greatest contribution to science was in his ability to observe and collate. His book *Elementa Chemiae* epitomized the important chemical investigations of the time.

Ampère

(1775-1836)

In March, 1936, France issued a stamp commemorating the 100th anniversary of the death of Ampère at Marseilles on June 10, 1836. The stamp (Scott No. 308) bears his likeness and is seventy-five centimes, brown.

We are so accustomed to thinking of Ampère as a physicist whose most important scientific contributions were in the field of electricity,

that we are apt to overlook his chemical attainments. He was, however, the first to show the analogy between fluorine and chlorine and as early as 1816 advanced the view that ammonium in its salts acted analogously to the metals.

Ampère

Ampère—Chimiste is the title of an article[4] appearing in *Chimie et Industrie* (*Paris*), for March, 1936. "The specialty of Ampère was that he had no specialty, or if one prefers, it was intermixed with science in all its length and breadth," states the article. "Among the many doctrines which his labors have made illustrious, renown has chosen one. It is the physicist. . . . It would not be difficult to show that . . . his work has not been without influence on more than one operation of industrial chemistry. The direct application of his knowledge to the problems of pure chemistry was not less fertile."

André Marie Ampère was born on January 22, 1775, in Polemieux, near Lyon. In 1801, he became professor of physics and chemistry at Bourg, and in 1809 professor of mathematics at the École Polytechnique in Paris. Concurrently with Avogodro, he discovered the "law of volumes" as a result of a study conducted between the years 1809 and 1814 of the laws of Gay-Lussac, Mariotte, and Charles. Ampère was the author of many remarkable scientific papers.

Pasteur

(1822-1895)

France commemorated the one hundredth anniversary of Pasteur's birth by the issuance in 1923 of a series of three stamps (Scott Nos. 165-167). These are all type A23, and show a profile bust of Pasteur. The values are ten centimes green, thirty centimes red, and fifty centimes blue.

The career of this great French chemist is beautifully depicted in the Warner Brothers' film production, "The Life of Louis Pasteur." It portrays the tremendous difficulties and discouragements with which he was confronted and which he so resolutely overcame.

Louis Pasteur was born on December 27, 1822, in Dôle and was destined to become one of the great benefactors of humanity as well

[4] I am indebted to Anthony J. Poirier for the translation of this article quoted here in part.

as one of the world's most distinguished scientists. His early education was at the Colleges at Arbor's and Besançon. He then attended the École Normale at Paris, held a professorship at Lille, later returning to the École Normale where he remained the rest of his active life. A disciple of Biot, his work on the tartaric acids and other optically active compounds contributed greatly to stereo-chemical knowledge. Following his early chemical researches were his brilliant researches in fermentation and his studies of micro-organisms which have had such far reaching effects upon sanitation, immunization, and preventive medicine. His remarkable scientific discoveries influenced the great work subsquently carried on by Lister.

Pasteur

Pasteur's life was characterized by a deep desire to help humanity. "Take interest, I implore you", said he, "in those sacred dwellings . . . laboratories. Demand that they be multiplied, that they be adorned; these are the temples of the future—temples of well-being and of happiness. There it is that humanity grows greater, stronger, better."

Pasteur was a contemporary of Berthelot. They were temperamentally unlike in many respects and especially so in their attitude towards religion. Devotion to research was, however, a common denominator in their lives. Pasteur's injunction quoted above is immortalized in the thousands of research institutions throughout the world. Berthelot's pioneer work is reflected universally in the tremendous advances of synthetic organic chemistry and in the great industry founded upon this branch of chemical science. The father of synthetic chemistry, (he was the first to use the term "synthetic"), Berthelot's work set up influences which have profoundly affected all aspects of human activity.

Berthelot

(1827-1907)

France also accorded philatelic recognition to Berthelot. His likeness appears in profile on a ninety centimes dull rose stamp, (Scott No. 241), type A33. It was issued in 1927 and commemorated the centenary of his birth and the founding of the Maison de la Chimie.

Marcellin Pierre Eugène Berthelot was born in Paris on October 29, 1827. The son of a physician, he began the study of medicine at the Collège de France but soon devoted himself to chemistry and became

assistant to Balard. In 1860, he became a full professor in the Collège de France. Berthelot's work upon glycerin was among his first important contributions. Later came his work on the action of hydriodic acid, reduction by zinc, pyrogenetic reactions, calorimetric methods, and on acetylene. In 1860, he published his *Chimie Organique Fondée sur le Synthèse*, a comprehensive account of his investigations into the possibilities of synthesis. His studies on ester formation and his work on explosives are outstanding.

Berthelot

To Berthelot we are also indebted for a number of historical studies dealing with early alchemy and with later alchemistic writings. His work, *La Révolution Chimique*, is also important, reproducing as it does Lavoisier's journals. For short periods, Berthelot held the posts of Minister of Education and Foreign Minister.

Mendelejeff

(1834-1907)

Soviet Russia in 1935 issued a series of four stamps commemorating the one hundredth anniversary of the birth of Mendelejeff. The series (Scott Nos. 536-9), consist of four values—type A184: five kopecks emerald green, and twenty kopecks ultramarine; and type A185: ten kopecks black-brown, and fifteen kopecks vermilion. The postal design of A184 shows Mendelejeff seated with the periodic table in the background, while A185 depicts his portrait with laurel wreath and also with the periodic table.

Mendelejeff

Dmitrij Ivanovitch Mendelejeff was born in Tobolsk, Siberia, on February 7, 1834. He first studied at the Institute of Pedagogy in St. Petersburg, then at the University of St. Petersburg and later spent a year in residence at Heidelberg. In 1866, the Chair of Chemistry at the University of St. Petersburg was conferred upon him. He conducted researches on capillarity and on the physical properties of gases, as well as on aqueous solutions, but he is best known by his studies on the periodicity of the elements. Later in 1869, he published his first paper on the periodic classification. Analogies between the

properties and the atomic weights of the chemical elements had been observed previously by Proust, Doebereiner, Pettenkofer, Chaucourtois, and Dumas, and in 1854, Dr. Josiah P. Cooke, of Harvard College, "made a classification more elaborate and complete than any which had preceded it." Later, Newlands, an English scientist, brought out his "law of octaves," but the evolvement of a more thorough generalization remained for Mendelejeff and for Lothar Meyer to formulate. These two men arrived simultaneously and independently at the same conclusion expressed in our modern statement of the periodic law, that *the properties of "elements" are periodic functions of their atomic weights.*

At one time, Mendelejeff was head of the Russian Chamber of Weights and Measures. His great book, *The Principles of Chemistry*, was an outstanding contribution to the scientific literature of his day.

Marie Curie

(1867-1933)

Turkey honored Madame Curie by issuing in 1935 a special stamp (Scott No. 1267), type SP22, bearing her likeness. This stamp is a fifty kurus (plus fifty kurus), dark slate-green and was commemorative of the Twelfth Congress of the Women's International Alliance.

It has been slightly more than a generation since the epoch-making researches in radioactivity by the Curies, Marie and Pierre, and the resultant discovery by them of polonium and radium. Only a quarter of a century has elapsed since the isolation of metallic radium by Madame Curie, a period replete with applications of her discoveries.

Madame Curie

Marie Curie (neé Sklodowska) was born November 7, 1867, in Warsaw, Poland. As a child, science always interested her. Her father was a teacher of science at the University of Warsaw, and when only seventeen she became an assistant in the chemical laboratory of the University. In 1891, she went to Paris to take up the study of chemistry at the Sorbonne and here she met Pierre. They were married in 1895. In 1898, after infinite labor the discovery of radium was announced by the Curies. This work had been conducted at the suggestion of Henri Becquerel, and in 1904

the Curies were the recipients jointly with Becquerel of a Nobel Prize. After the death of her husband in a traffic accident in Paris in 1906, Madame Curie continued her investigations into radio-activity and in 1910, working with Debierne, isolated the metal. Madame Curie was presented in 1911 with the Nobel Prize in Chemistry.

Madame Curie was the first woman to occupy a Chair in the Sorbonne. She also became the first director of the newly founded Radium Institute, known as the Pierre Curie Institute.

THE foregoing brief reference to stamps honoring famous chemists, and the little journeys to the homes of these personages, does not by any means write the last word on the subject. A search of stamp catalogs would reveal the names of other savants, some of whom were chemists, accorded philatelic honors — Lomonosov (Russia); Haller (Switzerland); Bacon (Newfoundland); Moscicki (Poland), and so on. Other sciences and arts have seen their workers recognized — medicine, engineering, literature, music, sports, etc. Pharmacy *per se* has not as yet received philatelic recognition, according to Frank A. Delgado in an admirable guest editorial[5] in which he appeals for a pharmacy stamp and in his more recent resumé[6] of the subject.

Chemistry, chemicals, and chemical processes have been represented in philately—to mention a few: Saltpeter (Chile), rubber (Congo), iron workers (Germany), sugar mill (Guadelope), foundries at Esch (Luxemburg), oil refinery (Peru), mining (Peru), blast furnace (Soviet Russia).

The collection and study of postage stamps are intensely interesting regardless of the motive which may be that of history, geography, travel, science, or fine arts. Philatelic studies have given pleasure to millions of persons.

I well remember a visit some years ago that I and several other members of the Washington Chapter had with Professor F. W. Clarke, shortly before his death. We had called at his home in Chevy Chase to present him with the engrossed scroll of Honorary Fellowship in THE AMERICAN INSTITUTE OF CHEMISTS. After this presentation, Professor Clarke showed us his collection of postage stamps beautifully arranged in a number of bound albums.

---

[5]Delgado, Frank A., "A Pharmacy Stamp Issue", *American Druggist*, XCII, No. 1., 17, 88 and No. 2., 48, 78, 80, 84. (1935)

[6]Delgado, Frank A., "La Farmacie y las Estampillas Postales", *El Farmaceutico*, XII, 16-17 and 41-43. (1936)

Professor Charles E. Munroe, F.A.I.C., in his delightful biography[7] of Clarke, states that "his stamp collection, which afforded him much pleasure during the years of his retirement, was bequeathed to the National Museum."

My own interest in stamps arose subsequent to our visit with Professor Clarke, and I have since been surprised to find that so many chemists have taken up this fascinating avocation. In this year of grace there must be literally thousands of us.

The profession of chemist in the United States should be philatelically recognized so that all who run may read and all who write may know. We have among our number, past and present, those of sufficient stature to be accorded this recognition on behalf of our profession.

The American chemist has served his country professionally in times of peace and of war, contributing largely to its industrial development, its public health, and its national defense. Chemists in the United States numbering approximately 40,000, work both independently and in collaboration with brother scientists in other fields, from agriculture to zoology. Chemistry is basic to all industry. Significant of the chemist's contribution to the material welfare of the United States is the present annual nationwide production value of all manufacturing industries of thirty-one billion dollars compared with the very small beginning three hundred years ago in the Colony of Massachusetts.

With these thoughts in mind, the Council of THE AMERICAN INSTITUTE OF CHEMISTS recently passed the following resolution, a copy of which was presented to Washington officials.

"RESOLVED: That THE AMERICAN INSTITUTE OF CHEMISTS approves the adoption by the United States Government of a postage stamp recognizing the chemist and his profession and suggests that an attempt be made through a proper committee to have favorable action taken on this plan."

In the philatelic gallery of world notables, France holds the premier position with portraits of her illustrious chemists. Other European countries have in like manner paid tribute to their savants and are continuing to do so. That our own country will in the near future philatelically recognize the American Chemist is a consummation devoutly to be wished and worked for.

---

[7]Munroe, Charles E., "Frank Wigglesworth Clarke", *J. Am. Chem. Soc. Proc.*, 57, 21-30. (1935)

The Wizard of Tuskegee

By W. Wade Moss, F.A.I.C.

Stranger than fiction, more romantic than a novel, the life story of this famous negro chemist is gripping and appealing in its beautiful realism. It reveals the trials and tribulations, the hardships and sufferings of a slave child, the privations of the student, and, finally, the crowning achievements of the master chemist.

THE LIFE, the achievements, the idiosyncracies of George Washington Carver, D.Sc., Ph.D., F.R.S., director of research and experiment at the Tuskegee Institute, Tuskegee, Alabama, are true manifestations of the characteristics and eccentricities of genius.

To have risen from slavery to fame is phenomenal. Born a slave, this man, the "Wizard of Tuskegee", has astounded the world by drawing from his test-tubes results which are nothing less than miracles.

George Carver's parents were slaves upon the plantation of Moses Carver, in Diamond Grove, Missouri. At the close of the War between the States, George was an infant, ill with the whooping cough. One night, George and his mother, Mary, were taken captives by a roving band of raiders which came to the plantation of Moses Carver. The baby was ransomed and recovered by Moses Carver, but its mother was spirited away and has never been heard from since. The ransom paid for young George was a race-horse valued at about three hundred dollars.

According to the practice among slaves, the child received his surname from his master, Moses Carver. His unfailing honesty and industry earned him the name of "George Washington". Frail, sickly, undersized, he helped Mrs. Carver with household work—tending fires, getting in wood, mending and cooking. George's ability as an excellent cook was only surpassed by his dexterity in sewing and mending.

His education began with a Webster's blue-backed speller. He learned every word of it. Mrs. Carver impressed upon him that life requires a thorough preparation obtained only by persistent study. When he had mastered the blue-backed speller, she gave him a Bible, many portions of which he memorized, even though he did not understand them.

AT THIS early age he had acquired not only a fervent love for agriculture; a reverence for things that grow, but he had unconsciously absorbed a fundamental knowledge of agricultural principles. This inculcated, induced knowledge served him well many years later as a part of his subconscious background.

When he was ten years old, he set out for the village of Neosho, eight miles away, to attend the small school there. A season of bad crops had greatly impoverished the frugal Carvers and they could give him no money. Arriving in Neosho without money or friends, he slept in an old barn until he picked up odd jobs. In two years he had mastered the rudiments taught in the Neosho school-house.

At the age of twelve, he begged a lift in a wagon as far as Fort Scott, Kansas. Here he began his fight for a college education, a fight which lasted for eighteen years before he obtained a degree.

Onward from Fort Scott he travelled to Minneapolis, Kansas, where he graduated from high school. After completing his high school education, George Carver went to Highland, Kansas. With his eyes still on a college education, his insatiate desire and ambition found vent in going diligently to work in order to save the necessary money. No job proved too tedious or menial for this determined negro boy. The white families of Highland became interested in the ambitious lad and gave him odd jobs, such as fine laundry work, knitting, tatting, and embroidery. Exceptional ability as a musician increased his popularity.

In the spring he settled in Ness County, Kansas, and filed on a homestead, where he built a sod house and put in crops. By doing house-work at the Gregg-Steeley Live Stock Ranch, he financed his new venture.

George's first agricultural experiment was unsuccessful. He found that this dismal, dry land was suitable only for grazing cattle, so he sold his homestead. The proceeds of his sale paid his way to Ames, Iowa, where he applied for admission at Iowa Agricultural and Mechanical College.

Refused at Ames, he matriculated at Simpson College, Iowa, (1887), where he studied music and art in addition to his regular course, earning his tuition by work in the college laundry. Throughout the following three years until his graduation from Simpson College, he fared well.

Again applying for admission at Ames, he was accepted, but a serious difficulty was that he had no home. Fortunately, "Tama Jim" Wilson,

then Dean of the College of Agriculture, and later Secretary of the United States Department of Agriculture, befriended George and permitted him to sleep in his office. The money George had earned and saved at Simpson paid his tuition at Ames, but left him only ten cents. However, of greater value than money to him was his indomitable will and courageousness in the face of hardships. With his dime he bought suet and meal and for a week he lived on this meagre fare. By the end of the week he had obtained laundry to wash. As his popularity increased and his capacity and reliability as a worker became known, his laundry prospered and he became self-supporting throughout the following five years of his college work at Ames.

At the end of three years he received his B.S. degree in agriculture, and he continued his work for another two years, receiving the degree of Master of Science. He was then placed in charge of the work in systematic botany and given the care of the college greenhouses. This gave him opportunity to pursue his investigations and to extend and deepen his knowledge in the field of the natural products of the soil, in which he now has achieved fame.

BOOKER T. WASHINGTON, who was making a great success of the Tuskegee Institute at Tuskegee, Alabama, visited Carver and employed him as professor of agriculture at Tuskegee Institute. He has been there for more than thirty-five years.

Every time Dr. Carver has been asked to leave Tuskegee to accept flattering and remunerative offers elsewhere, his answer is invariably, "Dr. Booker Washington told me to come to Tuskegee and 'let down my bucket'. This I have done and it has never failed to come forth, filled to overflowing."

His whole career has been devoted to the search for results which can help agriculturists to make the most of their products. His unselfish work is a most notable exemplification of the benefits which science can bring the South in particular and the world in general. He has served not only his own land, but many foreign lands. His daily mail is voluminous. Letters come from all parts of the world, containing such inquiries as: how to convert acres of sunflowers in Canada into some chemical product; how to utilize an acid-sludge residue from a large mineral oil company in Oklahoma; how to eliminate a disease affecting pineapples in Hawaii. These and many other problems Dr. Carver solves without leaving his laboratory. For this work he accepts no remuneration. He serves for the joy of serv-

ing. Strangely enough, he believes that God has given him this great knowledge of chemistry so that he may interpret God's generosity toward mankind.

In 1898, the farmers of Alabama were facing bankruptcy as the result of the boll weevil. They appealed to Dr. Carver, who advised them to raise peanuts, an almost uncommercial farm product at that time. Then, says Dr. Carver, "I set out to find ways and means to utilize the peanut. I discovered two hundred and seventy-two uses for it." Since 1898, the peanut industry has grown until over a million and a half acres are under cultivation, and the industry runs into more than sixty million dollars a year. A few years ago, the citizens of Enterprise County, Alabama, who had become prosperous during the years after Dr. Carver advised them to raise peanuts, erected a monument to the peanut and the prosperity it brought them.

Dr. Carver was awarded the Spingarn Medal in 1923 for the most distinguished contribution to science made by a negro. Later in 1925, he received the honorary degree of Doctor of Science from his Alma Mater. A Fellow of the Royal Society of Arts (London), an honor which testifies to his international renown, he is the only American negro who has ever received this great honor. A tablet showing his effigy was presented to Tuskegee Institute by one of the largest manufacturers of peanut products in the South. This tablet hangs in the new Science Building at Tuskegee Institute. At Tulsa, Oklahoma, a school has been named in his honor, the Carver Junior High School, a new building which cost $500,000.

Dr. Carver is constantly sought by foreign commissions and governments, Chinese, Swedish, British, French, etc., which have placed before him various national problems that they have not been able to solve.

HE HAS been the dynamic influence toward the application of chemistry to agriculture in the South. Each year, he prepares and distributes bulletins containing information and instruction for farmers, regardless of color.

He receives visits from all parts of the world, many of them from distinguished persons. In 1928, the Crown Prince of Sweden spent several weeks with Dr. Carver to obtain information concerning methods of converting agricultural substances into industrial raw materials. Theodore Roosevelt admired Dr. Carver's work and was one of his most devoted friends. The Prince of Wales on his American

tour spent several hours with Dr. Carver in his laboratory. A strange contrast of personalities was manifest in this meeting. More than seventy years old, Dr. Carver appeared stooped and bent with kinky white hair, his eyes deep sunken behind glasses which were inadequately held in position by a strand of cord frequently adjusted with long bony fingers. He was clad in a homespun suit made from materials which he himself had picked up in the fields during his rambles and converted into cloth. The suit was protected by an old blue apron, so patched as to resemble Jacob's coat. His shoes showed so many repairs that, doubtless, little of the original leather remained. His celluloid collar shone brightly in contrast to his black skin. This man faced the then Prince of Wales, who sets the styles in a man's world of fashion. Nevertheless, George Washington Carver, one-time slave, in all the true humility of greatness, held his Royal Highness spellbound as he told him of the wonders which are within the reach of the chemist who goes to the soil for his raw materials.

Countless numbers, white and colored, intellectual or illiterate, make pilgrimages to Dr. Carver's laboratory, to marvel at the wonders that may be seen there. He receives them all with equal graciousness.

During the World War, Dr. Carver spoke nearly two hours before the Ways and Means Committee of Congress upon the peanut tariffs. His recommendations and advice were adopted, with enormous savings.

Every year, Dr. Carver makes a lecture-tour of many of the leading American Universities. Among those which he has visited are Harvard, Johns Hopkins, Pennsylvania, and Virginia. During one trip, the Texas State Congress passed a special measure permitting him to speak in the schools, and in the State House before the State Senate and House of Representatives.

On one occasion, he made an address lasting more than two hours before a joint meeting of the Lions International, Rotary, and Kiwanis Clubs, at Columbus, Ga., receiving most enthusiastic and sustained applause from start to finish.

At one time, his life-long friend Thomas A. Edison offered him $50,000. a year on a five-year contract to work in Edison's laboratory on special problems of which he had expert knowledge. He has also been offered a professorship at a prominent university. At another time a synthetic marble company sought to persuade Dr. Carver to leave Tuskegee and locate in Mississippi, offering him his own price, to give his time to its work. His refusal to leave Tuskegee led that industry to move there, so as to facilitate access to Dr. Carver's knowl-

edge and experience in regard to its problems. But as Dr. Carver says, he will continue to remain at Tuskegee and "let down his bucket".

THOUGH Dr. Carver is considered a great creative chemist, his activities extend into many directions, agriculture, painting, sculpture, and music. One of his paintings, "A Rose", was sought by the Luxembourg Galleries, and he was offered a high price for this simple painting, which is said to be a masterpiece. This "Rose" expresses Dr. Carver's concept of infinite mind. He believes that God speaks to him and that his mind is much like that of a radio tube which receives God's will, and that his hands express the loveliness of God in manifesting His Handiwork as a painting. The pigments used were made by Dr. Carver from the red soils of Alabama. Dr. Carver has promised "A Rose" to the Luxembourg Galleries after his death.

One of his pecularities is that of rising each morning at four o'clock and walking alone in the woods where he communicates with God and receives his instructions for the day's work.

He is known as the "Peanut Wizard", on account of his phenomenal achievements which have added so much value to the lowly peanut. Characteristically, Dr. Carver takes no credit to himself for his achievements. In 1898, when he was faced with the problem of utilizing the large quantity of peanuts which he had recommended be raised, he solved his problem by taking a handful of peanuts, lifting his eyes to the eternal hills, and saying, "Mr. Creator, what is the peanut?" He tells that Mr. Creator said, "Take the peanut apart and you will understand what it is." Dr. Carver continues, "I took the peanut apart, and in a row I laid side by side the proteins, carbohydrates, the minerals, and the other constituents of the peanut. 'Now', said Mr. Creator, 'You know what the peanut is'. I raised my eyes again to the eternal hills and asked, 'Mr. Creator, why did you make the peanut?' Whereupon Mr. Creator said, 'I have given you three laws, namely compatibility, temperature and pressure. You take these various constituents of the peanut and put them together by means of these laws and I will show you why I made the peanut'. This I did, and there was revealed to me two hundred and seventy-two useful products."

When this was done, Dr. Carver returned to Mr. Creator and asked about the sweet potato, from which he has made one hundred and eighteen useful products. By these means, he has learned much of the creation story of the world and found uses for many natural

substances, such as producing veneers, paints, and stains from yucca and palmetto; paper, paints, foods and beverages from the commonest herbs and shrubs; stains, dyes, pigments, cosmetics from plain clays; rare colors from barnyard wastes; roofing materials, rubber, inks, beverages, pharmaceuticals, and explosives from peanuts and sweet potatoes; starch, gums, dextrins, and food products from cotton stalks; dyes from many plants, and many other products.

On one occasion some one sent Dr. Carver a large palmetto root from Florida as a challenge. Within a short time he came forth with lovely veneers resembling modernistic designs. A furniture factory took over this idea and brought prosperity to itself. From palmetto and green wood shavings, Dr. Carver has prepared a synthetic marble.

He has made valuable blue, purple, and red pigments from the red soils of Macon County, Alabama. These products are as everlasting as the soils themselves. It is said that they reveal an ancient Egyptian secret. The blue, which is said to be seventy-four times bluer than the bluest blue hitherto known, rivals the blues found in the tomb of Tut-Ankh-Amen. More than fifteen years ago, he painted the interior of the Methodist Church at Tuskegee with his "King Tut" blue. Today, it has lost none of its sheen or lustre.

DR. CARVER is of the type of person which recalls Mahatma Gandhi in many ways. He seeks for nothing for himself, beyond satisfying the simplest and most fundamental needs for sustaining life. He has no interest whatever in money or gain of any sort. His entire life has been one of whole-hearted sacrifice to the advancement of human knowledge and progress. His simplicity of manner and his complete devotion to science for its own sake and for the sake of his fellowmen, without distinction of color, race, or creed, reveal a personal character and nature to which ordinary rules of appraisal scarcely apply.

To Dr. Carver, Nature gave, in the body of a full-blooded negro, the soul, and the spirit, and the intellectual gifts of the whitest man ever born; and it consecrated its good work by bestowing upon him that greatest of qualities, the "humility of true greatness". Another remarkable characteristic of the man is his broad attitude toward the work of others in the same or in similar fields. Throughout his career, he has welcomed the activities and efforts of others to supplement his own work. He has been content to blaze the trail; he has never

sought to commercialize any of his creations, his aim being to demonstrate their possibilities, leaving the details of commercial or industrial application and development to others.

His work will be more fully appreciated as time goes on and as its merits and value are better understood.

Dr. Carver's clear unfaltering vision, his amazing ability to penetrate into the very atom, his attuneness to the theme of nature, place him in a class by himself. A full-blooded negro, Carver seems to be the atavistic expression of his race, embodying the peculiar gifts, possibilities, and tendencies of countless generations of the negro race. His quaint individualism approaches that of mystic or seer. His philosophy of success may be best expressed in his own words:

"When you do the common things of life in an uncommon way, you will command the attention of the World."

"Through the Aid of Science"

STATISTICS taken from the Bureau of Census, which appear in the March, 1936, issue of *The Index*, a publication of The New York Trust Company (New York), show that wage earners employed in the chemicals and allied products industries (exclusive of alcohol and liquor industries) increased 112.03 per cent from 1899 to 1933. In 1899 these wage earners amounted to 112,003, which represented 2.38 per cent of the total number of wage earners in the manufacturing industries. In 1914, 187,756 were employed by the chemical industries, or 2.67 per cent of the total number; in 1919, 292,403 were employed or 3.23 per cent of the total; in 1929, 280,868 or 3.18 per cent, and in 1933, 237,480 or 3.92 per cent. The percentage of total employment in the chemical products industries has thus risen from 2.4 in 1899 to 3.9 in 1933.

In this same article, Henry Ford is quoted as saying, "The only formula for providing prosperity is, through the aid of science, to produce the largest possible amount of goods with the least possible amount of human labor, marking each lowering of the cost of production by an increase in wages and a decrease in selling price. If this principle be carried through distribution and service, real wages will constantly rise and the amount of goods called for will employ every human being who needs employment. And sufficient wealth in usable things will be created to supply all needs. That is the only way it can come."

Simultaneous Reactions

By Howard W. Post, F.A.I.C.

A report from the Official Delegate of the American Institute of Chemists to the nineteenth annual Canadian Chemical Convention, held at the General Brock Hotel, Niagara Falls, Ontario, June 9, 10, 11, 1936.

TO AN AMERICAN citizen of years gone by, General Brock was a gallant foe who gave his life to keep us out of Canada. To British subjects, especially those of the North American Continent, he was a loyal subject of his King and a sturdy patriot. But to those of us who visited Canada during the ninth, tenth and eleventh of June, 1936, the name General Brock connotes the highest in hospitality and friendship.

On the three days mentioned the Canadian Chemical Association and the Canadian Institute of Chemistry convened in joint meeting at the General Brock Hotel, within a stone's throw of the Niagara River in the City of Niagara Falls, Ontario Province. The officers in charge told us that the registration set an all-high record, three hundred and sixty-five in all, of which sixty-one were American visitors from the AMERICAN INSTITUTE OF CHEMISTS and the American Chemical Society.

And the Yankee visitor saw not only Anglo-Saxon Canadians but others as well, for occasionally there could be heard the accent that was born among the heather and still more often the speech of Albion and the localized French of Quebec Province.

We were impressed from first to last by the spirit of friendly coöperation between the two organizations, and if during the course of this report this fact is stressed over-much, the blame should be placed on the impression that this coöperation created.

It seems that the Canadian Chemical Association is a much less centralized organization than is our American Chemical Society. Individual Associations (corresponding to our Sections) have much more autonomy than in this country. There does not seem to be any particular advantage to this situation, in fact observation gave some the impression that the Canadians are tending toward a more centralized government in their professional organizations. The convention was under the local management of the Niagara District Chemical and Industrial Association,

which is the local branch of the Canadian Chemical Association in Niagara Falls, Ontario. During the three days of the meeting, the members attended divisional meetings just as we do on this side—using the names of "Industrial and Engineering Section", "Biochemical Section", "Food and Cereal Section", "Chemical Education Section", and "Pure Chemistry Section", to describe their interests. In addition, the Society as a whole held a "General Session" on the first morning with appropriate papers. It was at this general session that we listened with interest to a paper presented by a representative from Ottawa showing that in physical volume Canadian business had hit its depression low in 1933, but since then had been slowly climbing month by month and was still on the up-grade.

Each noon a luncheon was held for all registrants and a suitable speaker was engaged to talk on some topic of general interest, such as, for instance, the "History of the Niagara Frontier", and later, the "Geology of the Niagara River Gorge". These luncheons were well patronized even by the lady guests. At the Wednesday luncheon, June tenth, the representative of the AMERICAN INSTITUTE OF CHEMISTS was officially introduced. The Chairmen of the luncheons were the Presidents of the Canadian Chemical Association (national), The Canadian Institute of Chemistry (national), and The Niagara District Chemical and Industrial Association (local), in order, and the program for each luncheon was made out by the official presiding. Each evening was given over to a more formal dinner and address.

The Canadian Institute of Chemistry held its annual business meeting on the afternoon of the last day at which summarized reports were presented by the Secretary and Treasurer and new officers inducted for the coming year. The membership now totals approximately five hundred, with the usual number of elections, promotions, etc. It seemed to some that the qualifications for membership were on a somewhat higher plane, however, than ours. Applications for admission as Fellow, for instance, must be accompanied by an extremely detailed life history of the applicant to date, and this life history is scrutinized carefully by the national council before action is taken. If the vote is seventy-five per cent or more in favor, the applicant is admitted; if less than that, he is usually requested to take an examination. There is a board which is set up for this express purpose. The examinations probably do not approach in intensity those conducted by the British Institute for similar purposes, but nevertheless are sufficiently severe to serve as an indication of the ability of the applicant and to dispel

all doubts in the minds of those who are already members as to the advisability of letting him in. In addition to all this, of course, the applicant must be a British subject. Many members of the Canadian Institute of Chemists are members of the British Institute as well, and the Canadian organization has naturally become imbued with some of the high ideals of the parent organization.

There exists, however, no satisfactory method of introducing the Institute to college students, such as we have in our annual student medal awards. In fact, we heard hearty expressions of approval of our plan coupled with the hope that some similar method cou'd be worked out in Canada.

To one who does not work, live, and play along the Niagara Frontier, the close associations that exist and have existed for years are in some cases quite startling. The Chairman at one of the noon luncheons was an Englishman who had been sent to the United States to manage a corporation which was at that time owned in England. He had taken out his citizenship papers and had become a full-fledged American citizen, because, as he expressed it, he wanted his children to be at home where they were living. He had subsequently been moved to Canada, whereupon he had renounced his American citizenship and had become again a British subject. One of the officials of the local organization, a Canadian, was educated at a leading American University, and at least two of the leaders in the Western New York Section of the American Chemical Society hail from our Northern Neighbor. Most of us were shocked and pleased to hear for the first time that recently our own government, looking around for the best place to build a lighthouse at the head of the Niagara River, found that its first choice was in Canadian waters. Nothing daunted, permission was requested of Canada and granted for the construction of the lighthouse, and there it stands today.

And above all, to a chemist, the community of spirit is deepened by listening to the topics of conversation he hears across the border and by the gradual realization that they are identical with those he hears within his own organization: "How can we increase our membership?", "What shall we teach the rising generation?", "Must we do this, or this, to balance our budgets?", "Whose theory best explains this reaction?", and so on.

Truly these reactions are simultaneous with ours and the catalysts, we believe, are the same.

BOOKS

COLORIMETRIC METHODS OF ANALYSIS. By Foster Dee Snell, F.A.I.C. and Cornelia T. Snell. *D. Van Nostrand Co., Inc.*

The Drs. Snell have produced a book for which there has been a crying need. The importance of determining small amounts of many inorganic elements has led, in the past two decades, to the publication of thousands of papers. These have been spread throughout the literature and have necessitated that a worker in the field spend a fair portion of his time in searching for analytical methods. As a result of the Snells' labors, much of this searching has been saved, as the book contains a sufficient choice of methods of determination for all of the common and many of the rarer elements.

In addition, the book contains nine introductory chapters in which the general principles of colorimetry are scientifically discussed; the variety of methods available are considered and their limitations carefully pointed out. These nine chapters, constituting the first hundred pages of the book, should be an absolute prerequisite for any one using colorimetric methods.

Naturally, in a volume of this size there are a few inescapable errors of one sort and another. The method of determination of arsenic by acid sodium thiosulphate, on p. 249, has evidently been mistranslated from a French source into Italian and the present authors carry the error over into English. One notes the omission of Eegriwe's fluorescence method for antimony. The sodium rhodizonate method for barium, although not very satisfactory, is the only direct colorimetric method for this element and should, therefore, have been included. Sufficient credit has not been given to Fairhall who really developed the di-thio-oxalate method for nickel.

However, the errors mentioned in the preceding paragraph detract only slightly from the value of the book, which, in the reviewer's opinion, is indispensable for every analyst.—Karl M. Herstein, F.A.I.C.

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June Meeting

The one-hundred and thirty-third meeting of the National Council of THE AMERICAN INSTITUTE OF CHEMISTS was held at The Chemists' Club, New York, N. Y., on June 15, 1936, at 5:30 P. M.

President Maximilian Toch presided. The following officers and councilors were present: Messrs: R. A. Baker, F. G. Breyer, R. J. Moore, H. S. Neiman, W. T. Read, A. Rogers, N. A. Shepard, M. Toch, and F. W. Zons. Miss V. F. Kimball was also present.

The minutes of the previous meeting were approved. The Secretary read a letter from the Treasurer which expressed his regret that illness prevented him from attending the meeting. A statement covering the condition of the Treasury was read.

Upon motion made and seconded, the emergency expenditures made by the Treasurer since May first were approved. Upon motion made and seconded, the Treasurer was authorized to make the expenditures covered by his letter.

A complaint from the technical staff of Joachim's Laboratory was presented, and after discussion, President Toch offered to investigate the matter further.

The death of Dr. J. A. Nieuwland was announced, and upon motion made and seconded, the Secretary was requested to draft proper resolutions expressing the sorrow of THE AMERICAN INSTITUTE OF CHEMISTS at the loss of its member; that these resolutions appear in THE CHEMIST, and that a copy of that issue of the publication be sent to the University of Notre Dame.

The Secretary read a letter from Mr. Walter William Plechner, F.A.I.C., and upon motion made and

seconded, the Secretary was requested to give such information about the activities of the INSTITUTE as will answer Mr. Plechner's inquiries.

The matter of a stamp commemorative of chemists or chemistry was presented again to the Council, and upon motion made and seconded, it was referred to President Toch and Mr. J. N. Taylor for action.

The President appointed Dr. Ross A. Baker and Dr. W. T. Reed as a committee to make recommendations for the formation of student chapters of the INSTITUTE.

Dr. Breyer called attention to the report of Mr. M. R. Bhagwat, Executive Secretary of the Committee on Unemployment for Chemists, copies of which had been distributed to the Councilors present.

Upon motion made and seconded, the representatives from the INSTITUTE to the Committee on Unemployment, were empowered to act for the INSTITUTE in relation to the Committe during the summer and to make a full report in the Fall.

The following new members were elected:

FELLOWS

IVEY ALLEN, JR., *Research Chemist*, Bakelite Corporation, Bloomfield, N. J.

JOHN M. COE, *Research Engineer*, Halowax Corporation, Bloomfield, N. J.

CHARLES N. FREY, *Director*, Fleischmann Laboratory, 810 Grand Concourse, New York, N. Y.

WILLIAM F. HEMPERLY, *Analytical Chemist*, Bakelite Corporation, Bloomfield, N. J.

ALMON G. HOVEY, *Director of Research*, Beck, Koller and Company, Inc., Detroit, Mich.

WILLIAM KRUMBHAAR, *Vice-president*, Beck, Koller and Company, Inc., Elizabeth, N. J.

JOSEPH B. LOMBARDO, *Standardization Chemist*, Calco Chemical Company, Inc., Bound Brook, N. J.

HERMANN C. LYTHGOE, *Director*, Food and Drug Division, Massachusetts Department of Public Health, Boston, Mass.

K. S. MARKLEY, 3712 Warren Street, N.W., Washington, D. C.

THOMAS W. MASON, Pennsylvania State College,, State College, Penna.

JOSEPH MATTIELLO, *Technical Director*, Hilo Varnish Corporation, Brooklyn, N. Y.

FRANK A. MCDERMOTT, *Chemical Superintendent*, Deepwater Alcohol Plant, E. I. du Pont de Nemours & Co., Deepwater Point, N. J.

NICHOLAS M. MOLNAR, *Chief Chemist*, Molnar Laboratories, New York, N. Y.

C. J. MONROE, *Associate Professor Physical Chemistry*, School of Mines and Metallurgy, University of Missouri, Rolla, Mo.

S. C. OGBURN, JR., *Professor Chemical Engineering*, Bucknell University, Lewisburg, Penna.

HENRY F. PALMER, *Chief Chemist*, Xylos Rubber Company, Akron, Ohio.

RUSSELL M. PICKENS, Rainier Pulp and Paper Company, New York, N. Y.

JAMES K. PLUMMER, *Director Products Division*, Tennessee Corporation, Atlanta, Ga.

GEORGE W. PUCHER, Connecticut Agricultural Experiment Station, New Haven, Conn.

ARTHUR D. ROBSON, *Vice-president*, Toch Brothers, New York, N. Y.

V. B. SEASE, *Director*, Redpath Laboratory, Du Pont Film Manufacturing Corp., Parlin, N. J.

GILBERT E. SEIL, *Technical Director*, E. J. Lavino and Company, Norristown, Penna.

J. VERNON STEINLE, *Research Director*, S. C. Johnson & Son, Inc., Racine, Wis.

H. W. STIEGLER, 455 W. 23rd Street, New York, N. Y.

ALVIN STRICKLER, *Professor of Chemistry*, Evansville College, Evansville, Ind.

RALPH G. VAN NAME, *Associate Professor Physical Chem.*, Yale University, New Haven, Conn.

GERALD WENDT, *Scientific Counsel*, General Printing Ink Corporation, New York, N. Y.

C. S. WILLIAMSON, JR., Tulane University, New Orleans, La.

JOHN H. YOE, University of Virginia, University, Va.

ASSOCIATE

WILBERT A. HERRETT, *Research Chemist*, National Aniline and Chemical Co., Buffalo, N. Y.

JUNIOR

LOUIS COHEN, *Draftsman*, Employed by Borough President of Manhattan, New York, N. Y.

STUDENT

SIDNEY C. SCHACHTMEISTER, *Electroplater*, Artistic Wire Forming Company, Brooklyn, N. Y.

There being no further business, adjournment was taken.

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Council Representative, Louis N. Markwood

OUR NEW MEMBERS

IVEY ALLEN, JR., F.A.I.C., received the Ph.D. degree from Duke University and later studied at the University of Freiburg. Specializing in synthetic resins, he is co-author of a number of technical papers. He is employed by the Bakelite Corporation of Bloomfield, N. J., as research chemist.

ALFRED R. BAYER, A.A.I.C., obtained the Ch.E. degree from Rensselaer Polytechnic Institute, and the M.S. degree from Lafayette College. Author of several articles, he is chemist for the Brooklyn Union Gas Company, Brooklyn, N. Y.

STUART R. BRINKLEY, F.A.I.C., received the A.B. degree from Emory College, the A.M. degree from Columbia, and the Ph.D. degree from Yale. Specializing in the teaching of chemistry, he is associate professor at Yale University, New Haven, Conn.

RALPH T. CASSELMAN, F.A.I.C., obtained the B.S. degree from the University of Wisconsin. He specializes in adhesives, cements, and plywood bonding, and holds the position of research chemist with the Bakelite Corporation, Bloomfield, N. J.

JOHN D. CLARK, F.A.I.C., holds the M.S. degree from the University of New Hampshire; the Ph.D. degree from Leland Stanford, and has also studied at Columbia. He is an authority on copper sulphide ores, and on the waters of the Southwestern United States. He is professor and head of the Department of Chemistry of the University of New Mexico, Albuquerque, N. M.

JOHN M. COE, F.A.I.C., received B.S. and Ch.E. degrees from Newark College of Engineering, N. J. He specializes in waxes and resins and is research engineer with the Bakelite Corporation, Bloomfield, N. J.

LOUIS COHEN, J.A.I.C., has B.S. and Ch.E. degrees from the College of the City of New York. He is employed as draftsman by the President of the Borough of Manhattan, Municipal Building, New York, N. Y.

RALPH T. K. CORNWELL, obtained the Ph.D. degree from Cornell University, and has studied at the University in Munich, Germany, and at the Medical-Chemical Institute in Graz, Austria. Specializing in microanalytical chemistry, organic chemistry, general industrial chemistry, cellulose, lacquers, varnishes and resins, he is chief research chemist for Sylvania Industrial Corporation, Fredericksburg, Va.

JOHN J. DONLEAVY, F.A.I.C., holds the Ph.D. degree from Yale. Particularly interested in organic chemistry, he specializes in the fields of heterocyclic bases, drugs, sesqui-terpenes, amino acids, purines, sulphur compounds, and resins. Author of several articles, he is assistant professor of chemistry at Yale University, New Haven, Conn.

ARTHUR C. FLENTGE, F.A.I.C., received a degree from the University of Buffalo. He specializes in emulsions and the development of synthetic methols and camphors. He is employed as chief chemist by The Mentholatum Company, Buffalo, N. Y.

ALFRED W. FRANCIS, F.A.I.C., received the degrees of B.S. and Ch.E. from Worcester Polytechnic Institute, and the degree of Ph.D. from Yale. He has also studied at George Washington University and Massachusetts Institute of Technology. Author of several publications, he specializes in the thermodynamics of hydrocarbons, the mechanism of flame reactions, the hydration of olefins, and the disective influence in benzene ring. He is research chemist for Socony Vacuum Oil Company, Paulsboro, N. J.

CHARLES N. FREY, F.A.I.C., holds the B.S. degree from Michigan State University, and the Ph.D. degree from the University of Wisconsin. He is director of the Fleischmann Laboratory of Standard Brands, Inc., New York, N. Y.

N. HOWELL FURMAN, F.A.I.C., obtained the Ph.D. degree from Princeton University. Author of more than thirty technical papers, he is author or coauthor of four books. He specializes in analytical chemistry, particularly physico-chemical applications; the use of hydrofluoric acid in analysis; potentiometric titrations; applications of ceric sulphate in volumetric analysis; and oxidation-reduction. He is associate professor of chemistry at Princeton University, Princeton, N. J.

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NEWS

Among the members of the AMERICAN INSTITUTE OF CHEMISTS, who presented papers at the Pittsburgh meeting of the American Chemical Society in September, were:

Ernst Berl, *Fritz Haber.*

Eugene C. Bingham, *A New Chemical Hood;* (with Carl E. Grant), *Free Volume.*

A. P. Black (with W. A. Dustin), *Conventional Constants of Pure Gum Rosin of Known Origin—I. Methods of Analysis, II. Effect of Species, Tree Size, and other Factors.*

A. R. Bliss (with G. R. Livermore), *A Study of the Toxicity of Mercurochrome in Rabbits.*

Edgar D. Bolinger (with Cecil V. King), *The Catalytic Decomposition of Diazoacetate Ion in Aqueous Solution.*

T. F. Bradley, *Drying Oils and Resins. II. Some Observations as to the Influence of Molecular Structure Upon the Oxygen Convertibility of Unsaturated Esters.*

A. T. Burtsell (with R. H. Müller), *Photoelectric Colorimetry. IX. The Determination of Copper by Means of the Starch-Iodine Reaction.*

C. D. Carpenter (with F. E. Lovelace), *Influence of Neutral Salts on the Optical Rotation of Gelatin.—V. Rotary Dispersion of Gelatin in Sodium Bromide Solutions.*

Beverly L. Clarke (with H. W. Hermance), *New Apparatus for Microanalysis.*

James F. Couch, *The Society of Arcueil.*

Irving A. Cowperthwaite (with John G. Dean), *The Dissociation Constant of Thallous Chloride.*

Gustav Egloff (with C. I. Parrish), *The Reactions of Olefins in the Presence of Metals.*

Gustav Egloff and J. C. Morrell, *Effect of Cracking on the Group Composition of the Hydrocarbons Distillates Produced Thereby;* (with Edwin F. Nelson), *Motor Fuel from the Cracking of Oils Produced by the Catalytic Water Gas Reaction.*

C. A. Elvehjem (with C. J. Koehn, Jr.), *Further Studies on Vitamin B_2;* (with M. O. Schultze), *Changes in the Glutathione Content of the Blood during Nutritional Anemia;* (with E. J. Schantz and E. B. Hart), *The Relation of Fat to the Utilization of Lactose.*

W. L. Evans (with H. W. Arnold, Harry Gehman and L. C. Kreider), *The Alkaline Degration of Certain Oligosaccharides.*

Sidney J. French (with Donald J. Saunders), *Determination of the Eutectic in the Indium-Gallium System.*

N. Howell Furman (with Clark O. Miller), *The Effect of Mercuric Salts upon the Iodine-iodide Potential. Applications to the Iodometric Determination of Arsenic and Antimony;* (with W. M. Murray, Jr.), *Studies of the*

Reducing Action of Mercury. III. Hydrogen Peroxide Formation and the Copper-catalyzed Autoxidation of Quinquivalent Molybdenum and Other Strong Reductants in Acid Solution.

H. W. Greenup (with L. E. Olcott), *Preparation and Properties of Latex Battery Separators.*

Arthur E. Hill (with John S. Wills), *Ternary Systems. XXII. Calcium Sulfate, Sodium Sulfate, and Water.*

C. R. Hoover, *Industrial Waste Treatment in Connecticut.*

V. N. Ipatieff (with A. V. Grosse), *Reaction of Cycloparaffins with Aromatic and Paraffin Hydrocarbons;* (with V. I. Komarewsky), *Hydropolymerization;* (with Herman Pines), *The Cleavage of Side Chains in Aromatic Hydrocarbons in the Form of Paraffins by Means of Aluminum Chloride.*

Martin Kilpatrick (with R. Burgess Mason), *Relative Acid Strengths in Normal Butyl Alcohol.*

C. G. King (with M. W. Green and G. D. Beal), *A Study of the Chemistry of Cascara Sagrada;* (with L. L. Bambas), *The Dehydrogenases of the Pneumococci;* (with Stella Gould and Donald K. Tressler), *Vitamin Content of Vegetables. — V. Raw and Cooked Cabbage;* (with Alex Sigal), *The Effect of Vitamin C Depletion on the Glucose Tolerance of the Guinea Pig.*

Frank O. Lundstrom and Colin W. Whittaker, *Chemical Reactions in Mixed Fertilizers. Effect of Ammoniation on the Urea Component of Superphosphate Mixtures.*

Alfred R. Macormac (with F. K. Cameron), *Comparison of Soda and Nitric Acid Pulps Made from the Whole Cotton Plant.*

Icie G. Macy (with Priscilla Bonner, Frances Cope Hummel, Mary F. Bates, James Horton, Helen A. Hunscher, and Marsh Poole), *The Effect of Spinach and Oxalic Acid on the Calcium and Phosphorus Metabolism of Children;* (with Frances Cope Hummel, Joseph A. Johnston, Helen A. Hunscher, Priscilla Bonner, and Mary F. Bates), *Maternal Requirements as Influenced by Nutritional State;* (with M. Lange, F. Kenyon, M. Poole, and B. Hamil), *A Study of the White and Differential Count during Infancy and Childhood as a Possible Criterion of Maturation;* (with M. Baters, H. Hunscher and M. Poole), *Gastrointestinal Motility and Fecal Formation of Children on a Fixed Diet.*

J. S. McHargue (with R. K. Calfee), *The Necessity of Minor Elements for the Growth of Tomatoes in a Poor Soil.*

A. L. Mehring, *The Extent to Which Chemical Research has Lowered the Cost of Fertilizers to Consumers since* 1880.

M. G. Mellon, *The Rôle of Spectrophotometry in Colorimetry.*

J. C. Morrell and Gustav Egloff (with Sophia Berkman), *Promoters and Poisons in Catalysis.*

Bernard L. Oser, *A Statistical Analysis of Vitamin A Data.*

Donald L. Reed (with K. G. Clark), *Potassium Nitrate from Potassium Chloride and Nitrogen Peroxide.*

William H. Ross (with John O. Hardesty), *Heat Developed in the Ammoniation of Superphosphates; The Granulation of Fertilizer Mixtures;* (with K. C. Beeson), *Chemical Reactions in Fertilizer Mixtures. Decomposition of Dolomite in Mixed Fertilizers.*

George L. Royer, *Micromethods for the Determination of Indium.*

Willem Rudolfs, *Importance of Industrial Waste in Stream Pollution in*

New Jersey; (with Lloyd R. Setter and C. N. Henderson), *The Ion Exchange Capacity of Activated Sludge.*

G. B. L. Smith (with Eugene Lieber), *The Preparation of Aminoguanidine by Catalytic Hydrogenation.*

R. C. Smith (with H. C. Howard), *Aromatization of Cellulose by Heat.*

Foster Dee Snell, *Treatment of Waste from Manufacture of Fiber Board Using Newspaper and Rope Stock. Heat Transfer with Non-Inflammable Organic Compounds.*

J. Vernon Steinle, *Carnauba Wax, An Expedition to its Source of Production.*

C. A. Thomas (with Frank J. Soday), *Varnish Resins from Cracked Distillates.*

W. C. Thompson (with J. J. Brennan, D. F. Mitchell, and F. P. Tierney), *The Fusibility of Coal Ash.*

R. N. Traxler (with H. E. Schweyer), *Influence of the Dispersed Particles on the Viscosities of Liquid-Solid Systems.*

Colin W. Whittaker (with J. R. Adams and K. D. Jacob), *Chemical and Physical Properties of Fertilizer Mixtures Containing Calcined Phosphate.*

John H. Yoe, *Introduction to Symposium in Colorimetry.*

Gustavus J. Esselen, F.A.I.C., and J. C. Hostetter, F.A.I.C., served as delegates to the International Union of Chemistry which was held in Lucerne, Switzerland, this summer.

Theodore F. Bradley, F.A.I.C., spoke on the *Chemistry of the Alkyd Resins* at the Gibson Island Research Conferences held under the auspices of Johns Hopkins University this summer.

Gerald Wendt, F.A.I.C., editor of *Chemical Reviews* and formerly assistant to the president of the Pennsylvania State College, has been elected director of The American Institute of the City of New York, succeeding L. W. Hutchins, who has resigned to devote himself to his business interests.

A new research unit, the Animal Nutrition Division, has been established by the Bureau of Animal Industry of the U. S. Department of Agriculture. Dr. Paul E. Howe has been appointed chief of the new division which is devoted to research on fundamental problems in the feeding of livestock.

Orville E. May, F.A.I.C., was recently appointed director of the Soy-bean Regional Laboratory, established by the Bureau of Chemistry and Soils of the U. S. Department of Agriculture, at the University of Illinois, Urbana, Illinois. Dr. May recently completed a tour of inspection of the various soy-bean processing plants and soy-bean research centers of the Middle West.

The American Section of the Society of Chemical Industry elected the following officers to serve for the year ending June, 1937; Chairman: James G. Vail, F.A.I.C.; Vice-chairman: Wallace P. Cohoe; Honorable Secretary: Foster Dee Snell, F.A.I.C.; Honorable Treasurer: James W. H. Randall, F.A.I.C.

Colin W. Whittaker, F.A.I.C., and Frank O. Lundstrom, F.A.I.C., of the U. S. Department of Agricul-

ture, Washington, D. C. recently were granted patent number 2038083, of which the subject is "A Process for the Decomposition of Nitrosyl Chloride."

The Truesdail Laboratories, Inc., 1206 Maple Avenue, Los Angeles, California, announce the appointment of three new staff members: C. E. P. Jeffreys, in charge of the analytical, bacteriological and biochemical activities; Miss Marion G. Sharp, nutritionist in charge of the animal colony; Irving A. Halpern, field chemist. Roger W. Truesdail, F.A.I.C., remains as president and director of the Laboratories, and will continue in charge of food and pharmaceutical formulations and research.

Florence E. Wall, F.A.I.C., has been appointed to teach Cosmetic Hygiene in the School of Education at New York University. This course, which has never before been offered at any American university, is designed to give sound, constructive information on cosmetic preparations and treatments.

In taking this forward step, the University is to be congratulated on its choice of an instructor. Miss Wall's pioneer work on the scientific and educational background of cosmetics and cosmetology has brought her national recognition from professional people, the trade, and the public as an outstanding authority in her chosen field.

As an active supporter of legislation for cosmetics, Miss Wall appeared at all of the Senate hearings on the Copeland Bill, and while serving as a Councilor of the INSTITUTE, she made efforts to have chemists openly included as qualified experts under the provisions of the Bill.

THE CHEMIST congratulates its former editor on her new achievement. The constructive work which has led to it would make an interesting additional chapter for the biography of Miss Wall which appeared in THE CHEMIST for April, 1932.

Robert Schmeidler, F.A.I.C., has joined the staff of Kenney-Herstein, Inc., Consulting Chemists, 18 East 41st Street, New York, N. Y., as an associate. Mr. Schmeidler has been connected for the past eleven years with the United Piece Dye Works as chemist in charge of the production and utilization of textile chemicals. In his new connection, Mr. Schmeidler will act as consultant on the production and application of chemical materials in the textile field and on textile processes.

Evening courses of college grade in biology, chemistry and other subjects, are available at Washington Square College of New York University. Information may be obtained from the Director of Evening Studies at the University.

Chester A. Snell, J.A.I.C., this year holds a graduate teaching fellowship at New York University, University Heights, New York, N. Y.

President Maximilian Toch has been elected an honorary member of The Chemical, Metallurgical and Mining Society of South Africa, Johannesburg, South Africa.

Memorial Resolutions

The National Council of THE AMERICAN INSTITUTE OF CHEMISTS, INC., having learned with profound regret of the death of its member, Julius Arthur Nieuwland, adopted the following resolutions at its meeting held on September 24, 1936:

RESOLVED:

Whereas, through the passing of Julius Arthur Nieuwland, chemistry has lost one of its most inspiring educators, whose contributions to organic chemistry have made an imperishable impression upon the science and upon the application of its principles for the benefit of mankind, and

Whereas, THE AMERICAN INSTITUTE OF CHEMISTS, INC., has lost a beloved and valuable member,

THEREFORE, BE IT RESOLVED that, in commemoration, this appreciation of his many sterling qualities be here recorded, that this resolution be printed in THE CHEMIST, and that a copy thereof be transmitted to Notre Dame University.

Civil Service Examinations

The U. S. Civil Service Commission announces open competitive examinations for positions of Principal Fuel Technologist ($5,600 a year), Senior Fuel Technologist ($4,600 a year), and Fuel Technologist ($3,800 a year). Vacancies to be filled exist in the Bureau of Mines, Pittsburgh Experiment Station, Pittsburgh, Penna.

Information may be obtained from the U. S. Civil Service Commission, Washington, D. C. Applications must be on file with this Commission not later than October 26, 1936.

Additional Membership

(Please add these names to the roster.)

Eisenman, Herschel I.
(1930), *Chemist*, A. Hollander and Son, Inc., 143 E. Kinney Street, Newark, N. J.

Ellery, Edward
(1936), *Professor of Chemistry*, Union College, Schenectady, N. Y.

Howard, Henry
(1936), *Consulting Engineer*, Paradise Road, Newport, R. I.

Witte, Paul J.
(1936), *Assistant to Technical Director*, Lucius Pitkin, Inc., 47 Fulton Street, New York, N. Y.

CHEMISTS ABROAD

By James N. Taylor, F.A.I.C.

AMERICAN Chemists Abroad during the Summer included a number of INSTITUTE members. England entertained the largest contingent of visiting chemists, many of whom also included Germany, France, Czechoslovakia, Denmark, and Italy, in their itineraries.

GERMAN chemists enjoy increased employment as a result of accelerated activity in the German chemical industry, resulting in large part from the national policy of encouraging the use of domestically-produced substitutes for imported natural materials, according to a report from *American Consul Sydney B. Redecker, Frankfort-on-Main.*

In consequence of the increased demand for chemists, especially in chemical and related branches of industry, unemployed professional chemists in Germany numbered only 970 at the end of 1935 compared with 1,430 at the end of 1932. As it is estimated that Germany had a corps of some 12,000 professionally-active chemists in 1935, it would appear that all but eight per cent were occupied in some gainful capacity at the close of the year. Of the occupied chemists, it is estimated that around 4,900 are engaged in the chemical industry, 4,400 in other industries, (metallurgy, etc.), 350 in public laboratories, and 1,300 in universities and public service.

THE CHEMICAL Engineering Congress which convened in London last June had a world-wide attendance. In the presence of representatives of nearly forty of the leading industrial nations of the world, reports *The Chemical Age* (*London*), the Duke of Kent opened the Chemical Engineering Congress of the World Power Conference at the Central Hall, Westminster. Lord Leverhulme, president of the Congress, was in the chair, and the heads of all the overseas delegations, together with the presidents of all the British chemical and chemical engineering organizations, were on the platform.

The Duke of Kent said it was twelve years since his brother, the King, when Prince of Wales, opened the first World Power Conference at Wembley. Next September there was to be the third World Power Conference at Washington, at the invitation of the United States Government, and he knew many of those present this day were looking forward to that event. He wanted to express a warm welcome to all the delegates and members who had come to London from overseas. He knew from his own experience what a fine welcome and what charming hospitality greeted his countrymen when they went abroad, and he hoped they would be able to return that kindness and hospitality on the present occasion.

M. AUGUSTE BÉHAL, member of the Academy of Sciences and the Academy of Medicine, president of *la Maison de la Chimie*, was recently honored by his colleagues, his students, and his friends in France and abroad. During the course of the manifestation, he was presented with a plaque bearing an excellent likeness of this eminent chemist.—*Chimie et Industrie* (*Paris*).

CHEMISTS of New Zealand are up in arms over the encroachment of Company pharmacy. The news that Boots, Ltd. has obtained properties in Tasmania, Victoria and Queensland has resulted in a proposed amendment to the Pharmacy Act which makes it illegal for a corporation or limited liability company to carry on business as a pharmaceutical chemist or to use the title of chemist, druggist or pharmacist. The Secretary of the C. Ph. A. has had inquiries from New Zealand about conditions in Canada.—*Canadian Pharmaceutical Journal (Whitby)*.

SIR CHRISTOPHER CLAYTON has given an instance of the astonishing memory of Sir Oliver Lodge. Several years ago he met Sir Oliver in a Liverpool thoroughfare and, accosting the veteran scientist, said: "You cannot possibly know me, but I was a student of yours in Liverpool forty years ago." Sir Oliver paused a moment, and asked: "How are Pilkington and Crossley?" These two men had sat on either side of Sir Christopher in the classroom. — *Indicator.*

ACCORDING to statistics on industrial employment in Italy prepared by the Confederation of Industry, the average number of operatives employed in the chemical industry in August, 1935, was 50,611 compared with 42,900 in August, 1934.—*Trade Commissioner Elizabeth Humes (Rome)*.

DR. T. DILLON, professor of chemistry at the University of Galway, has been elected president of an Association of Chemists in Ireland recently organized at Dublin, reports *L'Industrie Chimique (Paris)*. Mr. B. Fagan, chairman of the Dublin Section of the Institute of Chemistry, was chosen vice-president. The objects of the Association are to coördinate the activities of its members, to create a service of placement, and to ameliorate the material situation of the chemist.

"THE CHEMIST as World Citizen" was the title of the presidential address delivered by Mr. W. A. S. Calder at the Fifty-fifth Annual Meeting of the Society of Chemical Industry held July sixth to tenth at Liverpool. The retiring president spoke of the relations between war, accidents, and chemists, and suggested how the chemist can, in his opinion, fulfill his function as world citizen. In concluding his inspiring address, he said: "Shakespeare, with his rare vision, tells us 'There's a Divinity that shapes our ends, rough hew them how we will'. The chemist can merely play the man, trusting that the Divine Alchemist will transmute the base metal of his feeble effort into the fine gold of glorious achievement."

CHEMICAL industry workers are among the highest paid in China, according to figures recently published by the *Bureau of Social Affairs of the Nanking Municipal Government*, which show that male workers in the industry receive average monthly wages of 23.53 dollars.* The highest paid trade of all in China is furniture manufacture, where the average monthly wages are 35.33 dollars.*

—*Chemical Trade Journal (London)*.

*The Chinese dollar or yuan is equivalent to $0.30 in U. S. currency.

"The time has come," the Walrus said,
"To talk of many things:
Of shoes—and ships—and sealing wax—
Of cabbages—and kings—"
The Walrus and the Carpenter

Catalytic Oxidation of Natural Gas

By JOHN DAMNSMITH, Ph.D., B.G.
(Contribution from the Laboratory of East Hobokus College)

In certain experimental work with natural gas I have found that it may be oxidized by air under the influence of catalysts with the production of a volatile but condensible liquid. While a large number of catalysts may be used, I have found metallic iron and metallic copper to be active and well adapted. The oxidizing action in the presence of these catalysts goes on smoothly and readily, and is highly exothermic, liberating much heat. Some control of the temperature is desirable and this may be effected by cooling the catalyst. In the case of Pittsburgh natural gas, consisting mainly of methane, the heat evolved is not far from 13.25 Cals. per gram. The action may be initiated by heating the catalyst, or the gas, or the air; and it thereafter continues regularly without necessity of the introduction of external heat.

On cooling the reaction products from a mixture of air and natural gas, a white colorless liquid may be obtained in large yields. The reaction appears to be extraordinarily productive, the yield of condensible liquid products being not far from 2.3 parts by weight from each part by weight of the gas or over 200 per cent. This large yield, however, is due to the fact that the new product contains a considerable amount of oxygen, about 88 per cent as far as my preliminary determinations show.

The reaction may be performed in any of the usual laboratory apparatus, a stream of air and a stream of the gas being allowed to come together in the presence of the catalyst, and reaction initiated by heating. A quartz tube containing copper or iron on asbestos may be employed and is better than the usual glass tube for the reason that the heat developed in the action may melt the glass. Quartz is free from this objection. Instead of using the metals on asbestos they may be used as gauze, pellets or any other massive form. The products coming from the reaction zone may be cooled in any suitable condenser. It is advisable to cool first in a metal or quartz tube before running into the ordinary Liebig since exit gases are extraordinarily hot. From the ordinary Liebig condenser may be obtained easily and rapidly a copious condensate of clear colorless rather volatile liquid. If the cooling be effected under very heavy pressure, the yield is somewhat increased but the liquid effervesces and loses weight again on exposure to the ordinary temperature and pressure. Study of this effervescent liquid, which appears to have some interesting properties, will be

continued at a later date. It may here, however, be noted that when used in connection with a little alcohol it seems to have interesting physiological results.[1]

Not all the chemical and physical constants of the liquid product have as yet been determined, but I may say in a prefactory way that it appears to be of a purity unusual in synthetic products ordinarily obtained in reactions of this class, a single redistillation giving a product with a practically constant boiling and freezing-point. The redistilled material is a clear, colorless, tasteless liquid of quite extraordinary solvent powers. It seems to contain a hydroxyl (.OH) group and reacts readily with many inorganic chemicals to give various bodies now under investigation in this laboratory. Although containing hydroxyl it it unlike most of the organic bodies containing hydroxyl, such as the alcohols and acids, in having little physiological activity alone; although some of its mixtures with other things are quite active. In fact alone it is quite harmless even if taken in relatively large amounts, neither producing intoxication nor having any corrosive action.

Its boiling point at 633.778 mm is 95°C and it solidifies quickly as interlaced crystals at 0°C. In solidification it expands somewhat and the crystals at first produced have a tendency to float.

Most of the ordinary inorganic salts, and particularly the nitrates, are dissolved by it to a greater or less extent; and many organic bodies are also soluble in it. Common cane sugar is dissolved to an extraordinary extent, one part of the liquid dissolving no less than two parts of sugar to produce a thick, heavy sirup; a fact which may possibly be utilized in the event of the commercial production of the liquid in the way described.

In view of its solvent properties and of the fact that it contains the hydroxy group, I propose to call it hydroxysolveol, using the shortened form hydrol for commercial purposes.

In the event of the possible synthetic manufacture of this material on the large scale by the noted reaction, it is possible to utilize the external amount of heat developed. Certain preliminary experiments have shown that the copper or iron catalyst may indeed be used in the form of a boiler tube and the heat utilized for raising steam. This is a very convenient method of performing the action since not only does it allow utilization of the great heat for useful purposes but it also serves to cool down the reaction mixture to a temperature where condensation of the liquid product in ordinary condensers is quite practicable.—K. P. McElroy in *Journal of Ingenuous or Almost Chemistry.*

[1]Research on this combination or mixture has not gone far enough to give exact results but it may be here noted that the following mixture has interesting physiological properties:

R Liquid product	100 cc
Sp. frumenti	20 cc
Sacch. alb.	q.s.
	q.s
Fuit gallicaudi	

Contented Cows

Mrs. B——: I don't believe this milk is up to standard. It looks suspiciously blue.

Larry: You're wrong, darling. This is our best grade milk. You see, our cows are pastured on blue grass.

—*The Pathfinder.*

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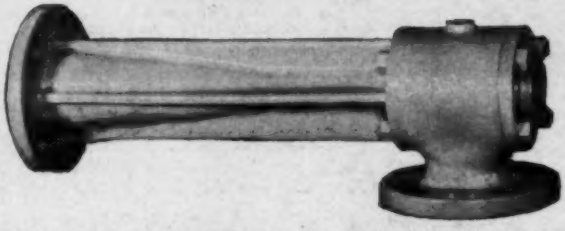

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